

R/V Shumpu Maru Cruise SU9309

## 1 Cruise Narrative

### 1.1 Highlights

#### Expedition Designation

Shumpu Maru Cruise SU9309

#### Chief Scientists

Leg 3:Noriya YOSHIOKA, Kobe Marine Observatory(KMO)

#### Ship

R/V Shumpu Maru

#### Ports of Call

Leg 3:Hososima to Kochi

#### Cruise Dates

Leg 3:October 2 to October 6,1993

### 1.2 Cruise Summary

The cruise track and station locations of leg 3 are shown in Figure 1.

The ship departed Hososima on October 2,1993, and made 3 CTD/rosette stations of a section PR17. 1 XBT stations were made between CTD/rosette stations. To first CTD/rosette station the ship reached at 1153 UTC on October 2, from last station departed at 2009 UTC on October 2.

The CTD is EG&G NBIS Mark III B(6500 db type, no oxygen sensor). Water samples were collected from 1.7 liter Niskin bottles mounted on the General Oceanics Rosette multisampler. However, surface water samples were collected by a bucket.

### 1.3 List of Principal Investigators

The principal investigators for all the parameters measured on the cruise are listed in Table 1.

Table 1: Principal Investigators for All Measurements

Name	Responsibility	Affiliation
Sukeyoshi TAKATANI	Oxygen,Nutrients	KMO
Ryohei OKADA	CTD,S	KMO

### 1.4 List of Cruise Participants

The cruise participants for leg 3 are listed in Table 2.

Table 2: Cruise Participants for leg 3

Name	Responsibility	Affiliation
Noriya YOSHIOKA	Chief Scientist	KMO
Ryohei OKADA	CTD Hardware	KMO
Nobuo SATO	Oxygen, Nutrients	KMO
Satoshi SUGIMOTO	CTD Software	KMO
Sukeyosi TAKATANI	Oxygen, Nutrients	KMO
Keiichi SATO	Watch Stander	KMO
Akira NAKADATE	Oxygen, Nutrients	KMO
Toshiaki BABA	Watch Stander	KMO
Hiroki SUZUKI	Watch Stander	KMO

## 2 Measurement Techniques and Calibrations

### 2.1 CTD

The CTD is EG&G NBIS Mark III B(6500 db type, no oxygen sensor).

A HP 9000 Series 300 model 330(Hewlett Packard) with a 4 MByte of memory was used as the primary data collection device.

The temperature and pressure sensor were calibrated at the calibration facility of SYEYA CO., LTD before the cruise. The results are shown in Table 3.

Temperature and pressure(increasing) calibration values are used to correct CTD data, by linear interpolation inside the calibrated regime. CTD data outside of the regime is corrected by the calibration values on the boundary, at the each side.

Notice that the upcast pressure data is corrected by Pressure(increasing), not Pressure(decreasing) in Table 3.

Table 3: The temperature and pressure sensor calibration values

Temperature(Calibrated on October 9, pre-cruise)

Standard Temperature	CTD Temperature	Difference
0.1512	0.1522	0.0000
15.1490	15.1498	0.0008
30.0912	30.0912	0.0010

Pressure (increasing, Calibrated on september 6, pre-cruise)

Standard Pressure	CTD Pressure	Difference
0.0	0.1	-0.1
1516.8	1515.8	1.0
3033.7	3030.3	3.4
4550.5	4545.7	4.8
6067.4	6067.8	-0.4

Pressure (decreasing, Calibrated on september 6, pre-cruise)

Standard Pressure	CTD Pressure	Difference
0.0	0.1	-0.1
1516.8	1520.0	-3.2
3033.7	3030.8	-2.9
4550.5	4545.8	4.7
6067.4	6068.0	-0.6

The conductivity sensor were calibrated at sea using data from the analyses of salinity collected at 4 stations. The salinometer is AUTOSAL 8400B(Guildline) for the analyses of salinity of the water samples. The calibration constant is determined assuming that the bias 0. The results are shown in Table 4.

Table 4: The conductivity sensor calibration constants

Bias	Slope
0	1.00040

The temperature of "SU9309.SEA" and "SU9309.CTD" files is described with the international temperature scale of 1990, ITS-90.

### 2.2 Oxygen Measurements

The determination of dissolved oxygen was done by the modified version of the Winkler method described in "Kaiyo Kansoku Shishin (Manual of Oceanographic Observation)" published by the Oceanographical Society of Japan(1970). No estimation of accuracy and precision and reagent blank has been done.

### 2.3 Nutrients Analyses

The nutrients analyses were done by the Technicon Auto Analyzer II described in "Kaiyo Kansoku Shishin (Manual of Oceanographic Observation)" published by the Oceanographical Society of Japan(1970). No estimation of accuracy and precision has been done.